

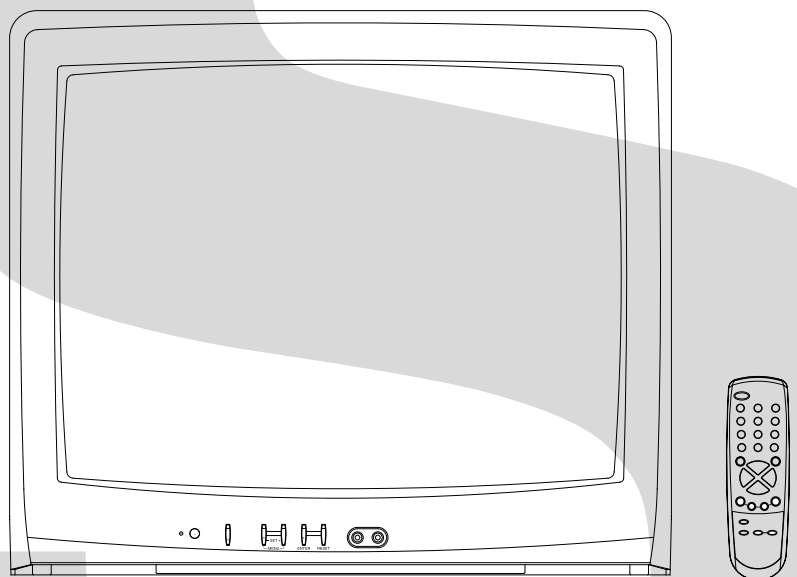
TOSHIBA

FILE NO. 050-200502

SERVICE MANUAL

COLOR TELEVISION

19A25



SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES


As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a  mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the external exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT

Inferior silicon grease can damage IC's and transistors.

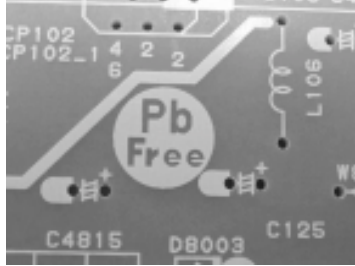
When replacing an IC's or transistors, use only specified silicon grease (YG6260M).

Remove all old silicon before applying new silicon.

ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF PCB:

PCBs (manufactured) using lead free solder will have a PbF printing on the PCB.
(Please refer to figures.)



Caution:

- Pb free solder has a higher melting point than standard solder;
Typically the melting point is 50°F~70°F(30°C~40°C) higher.
Please use a soldering iron with temperature control and adjust it to 650°F ± 20°F (350°C ± 10°C).
In case of using high temperature soldering iron, please be careful not to heat too long.
- Pb free solder will tend to splash when heated too high (about 1100°F/ 600°C).
- All products with the printed circuit board with PbF printing must be serviced with lead free solder.
When soldering or unsoldering, completely remove all of the solder from the pins or solder area,
and be sure to heat the soldering points with the lead free solder until it melts sufficiently.

Recommendations

Recommended lead free solder composition is Sn-3.0Ag-0.5Cu.

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GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size	19 inch / 480.0mmV	
			CRT Type	Normal	
			Deflection	90 degree	
			Magnetic Field BV/BH	+0.45G/0.18G	
			Color System	NTSC	
			Speaker	1Speaker	
				Position	Bottom
				Size	3 Inch
				Impedance	8 ohm
			Sound Output	MAX	1.5 W
		10%(Typical)	1.0 W		
		NTSC3.58+4.43 /PAL60Hz	No		
G-2	Tuning System	Broadcasting System		US System M	
		Tuner and Receive CH	System	1Tuner	
			Destination	USA(W/ CATV)	
			Tuning System	F-Synth	
			Input Impedance	VHF/UHF 75 ohm	
				CH Coverage	2 - 69, 4A, A-5 - A-1, A - I, J - W, W+1 - W+84
			Intermediate Frequency	Picture(FP)	45.75MHz
				Sound(FS)	41.25MHz
				FP-FS	4.50MHz
			Preset CH		No
	Stereo/Dual TV Sound		No		
	Tuner Sound Muting		Yes		
G-3	Power	Power Source	AC	120V AC 60Hz	
			DC		
		Power Consumption		at AC	
			Stand by (at AC)		73 W at AC 120 V 60 Hz
		Per Year		5 W at AC 120 V 60 Hz	
				-- kWh/Year	
	Protector	Power Fuse		Yes	
G-4	Regulation	Safety		UL	
		Radiation		FCC	
		X-Radiation		DHHS	
G-5	Temperature	Operation		+5oC ~ +40oC	
		Storage		-20oC ~ +60oC	
G-6	Operating Humidity			Less than 80% RH	

GENERAL SPECIFICATIONS

G-7	On Screen Display	Menu		Yes	
		Menu Type		Character	
		Picture		Yes	
			Contrast		Yes
			Brightness		Yes
			Color		Yes
			Tint		Yes
			Sharpness		Yes
			Audio		No
			Bass		No
			Treble		No
			Balance		No
			BBE On/Off		No
			Stable Sound On/Off		No
			CH Set Up		Yes
			TV/CABLE(CATV)		Yes
			Auto CH Memory		Yes
			Add/ Delete		Yes
			Language		Yes
			V-chip		Yes
			Lock		Yes
			On Timer		Yes
			CH Label		No
			Favorite CH		No
			Color Stream DVD/DTV		No
			Control Level		Yes
			Volume		Yes
			Brightness		Yes
			Contrast		Yes
			Color		Yes
			Tint		Yes
			Sharpness		Yes
			Tuning		No
	Bass		No		
	Treble		No		
	Balance		No		
	Back Light		No		
	Stereo,Audio Output, SAP		No		
	Video		Yes		
	Color Stream		No		
	Channel(TV/Cable)		Yes		
	CH Label		No		
	Game Timer		Yes		
	Sleep Timer		Yes		
	Sound Mute		Yes		
	V-chip Rating		Yes		
G-8	OSD Language		English French Spanish		
G-9	Clock and Timer	Sleep Timer	Max Time	120 Min	
			Step	<u> 10 </u> Min	
		On Timer	Program(On Timer)	Yes	
		Wake Up Timer		<u> No </u>	
	Timer Back-up (at Power Off Mode)	more than	-- Min Sec		

GENERAL SPECIFICATIONS

G-10	Remote Control	Unit	RC-EH	
		Glow in Dark Remocon	Yes	
		Format	Toshiba	
		Custom Code	40-BF h	
		Power Source	Voltage(D.C) UM size x pcs	3V UM-4 x 2 pcs
		Total Keys		27 Keys
		Keys	Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0	Yes
			100	No
			CH Up	Yes
			CH Down	Yes
			Volume Up	Yes
			Volume Down	Yes
			TV/Caption/Text	Yes
			CH1/CH2	Yes
			TV/Video(TV/AV)	Yes
			CH RTN/CH ENT(Quick View)	Yes
			Sleep	Yes
			RE Call(Call)	Yes
			Reset	Yes
			Menu	Yes
			Enter	Yes
			Mute	Yes
			Exit	No
			MTS(Audio Select)	No
			Set +	Yes
			Set -	Yes
			Multi Brand Keys	
			CH Up(VCR)	No
			CH Down(VCR)	No
			Pause/Still	No
	TV/VCR(VCR)	No		
	Code	No		
	FF	No		
	Rew	No		
	Rec	No		
	Play	No		
	Stop	No		
	TV	No		
	VCR	No		
	Cable	No		

GENERAL SPECIFICATIONS

G-11	Features	Auto Degauss	Yes	
		Auto Shut Off	Yes	
		Canal+	No	
		CATV	Yes	
		Anti-theft	No	
		Rental	No	
		Memory(Last CH)	Yes	
		Memory(Last Volume)	Yes	
		V-Chip	Yes	
		Type	<u>USA,ORION Type</u>	
		BBE	No	
		Auto Search	No	
		CH Allocation	No	
		SAP	No	
		Just Clock Function	No	
		CH Label	No	
		VM Circuit	No	
		Full OSD	No	
		Premiere	No	
		Comb Filter	No	
		Lines		
		Auto CH Memory	Yes	
		Hotel Lock	No	
		Closed Caption	Yes	
		Stable Sound	No	
		FBT Leak Test Protect	Yes	
		CH Lock	Yes	
		Video Lock	Yes	
		Game Timer (Max Time:120 Min)	Yes	
		Stable Sound	No	
		Energy Star	No	
		Power On Memory	Yes	
		Favorite CH	No	
G-12	Accessories	Owner's Manual	Language W/ Warranty	English / Spanish Yes
		Remote Control Unit		Yes
		Rod Antenna	Poles Terminal	No
		Loop Antenna	Terminal	No
		U/V Mixer		No
		DC Car Cord (Center+)		No
		Guarantee Card		No
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Facility List		No
		Important Safety Instruction		No
		Dew/AHC Caution Sheet		No
		AC Plug Adapter		No
		Quick Set-up Sheet		No
		Battery	UM size x pcs OEM Brand	Yes UM4 x 2 No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Registration Card (NDL Card)		Yes
		ESP Card		No
		PTB Sheet		No
		300 ohm to 75 ohm Antenna Adapter		No

GENERAL SPECIFICATIONS

G-13	Interface	Switch	Front	Power	Yes	
				System Select	No	
				Main Power SW	No	
				Sub Power	No	
				Channel Up/Reset	Yes	
				Channel Down/Enter	Yes	
				Volume Up/Set Up	Yes	
				Volume Down/Set Down	Yes	
				MENU=Volume Up+Volume Down	Yes	
			Rear	AC/DC	No	
				TV/CATV Selector	No	
				Degauss	No	
				Main Power SW	No	
			Indicator	Power	Yes	
				Stand-by	No	
				On Timer	No	
			Terminals	Front	Video Input	RCA
				Audio Input	RCA x 1	
				Rear	Other Terminal	No
					Video Input(Rear1)	No
					Video Input(Rear2)	No
					Audio Input(Rear1)	No
					Audio Input(Rear2)	No
					Video Output	No
					Audio Output	No
			Euro Scart	No		
			Color Stream	No		
			Diversity	No		
			Ext Speaker	No		
			DC Jack 12V(Center +)	No		
			VHF/UHF Antenna Input	F Type		
			AC Outlet	No		
G-14	Set Size	Approx. W x D x H (mm)		<u>488 x 465 x 416</u>		
G-15	Weight	Net (Approx.)		<u>17.5kg (38.6 lbs)</u>		
		Gross (Approx.)		<u>20.0kg (44.1 lbs)</u>		
G-16	Carton	Master Carton		No		
			Content	--- Sets		
			Material	-- /--		
			Dimensions W x D x H(mm)	-- x -- x --		
			Description of Origin	No		
			Gift Box		Yes	
				Material	Double/Brown	
				Dimensions W x D x H(mm)	<u>546 x 526 x 472</u>	
				Design	As per Buyer's	
				Description of Origin	Yes	
	Drop Test		Natural Dropping At 1 Corner / 2 Edges / 4 Surfaces			
		Height (cm)	60 (ORION SPEC:46)			
		Container Stuffing	<u>436</u> Sets/40' container			
G-17	Cabinet Material	Cabinet	Cabinet Front	PS 94V0 DECABROM		
			Cabinet Rear	PS 94V0 DECABROM		
		PCB	Non-Halogen Demand	No		
			Eyelet Demand	Yes		
G-18	Environment	Pb-free Soldering	Yes			
		Parts Specificat	Yes			

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

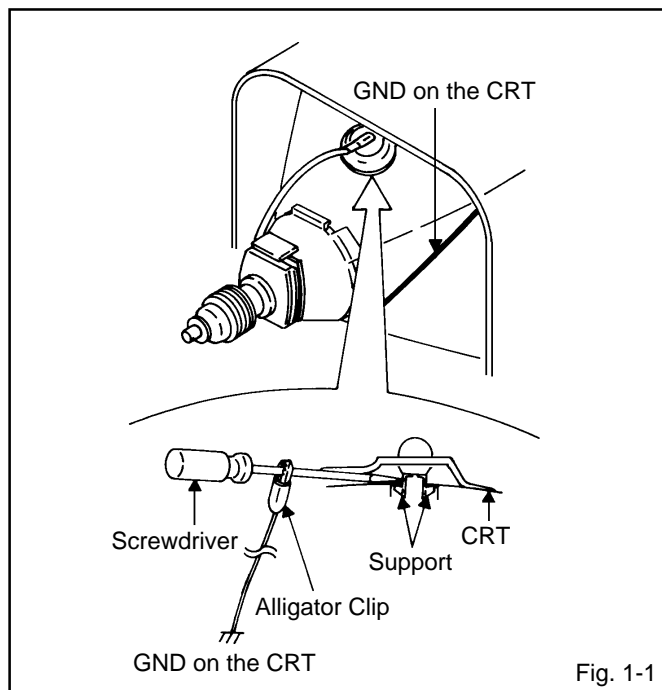
Read the following **NOTED** items before starting work.

- * After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- * Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

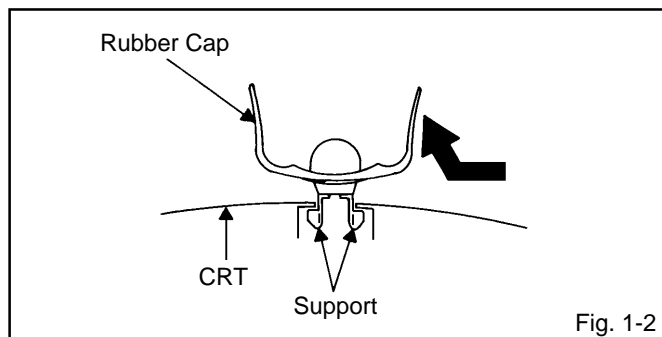
REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. (Refer to Fig. 1-1.)

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver. A cracking noise will be heard as the voltage is discharged.



2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. (Refer to Fig. 1-2.)



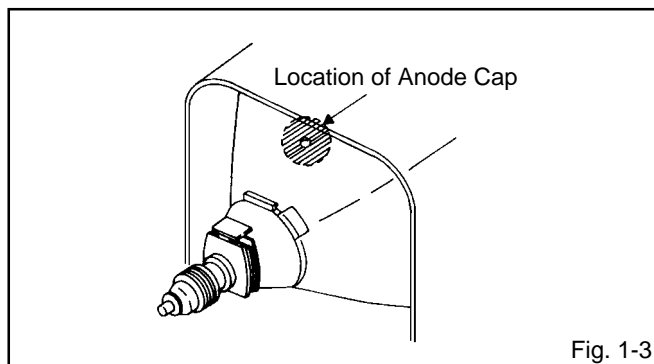
3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

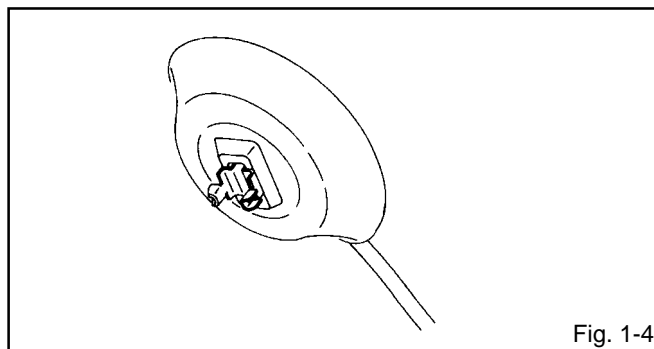
1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 1-3.)



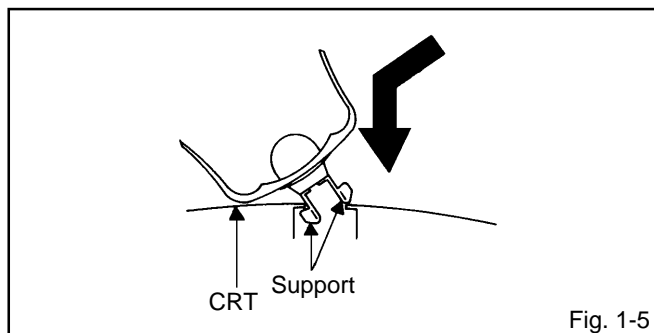
NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 1-4.)



4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 1-5.



5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

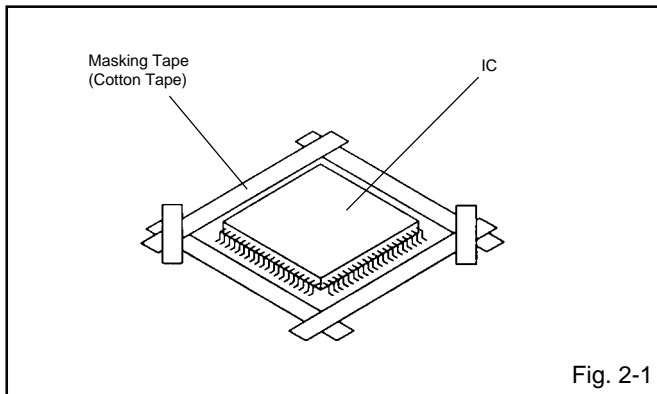
2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. (Refer to Fig. 2-1.)

NOTE

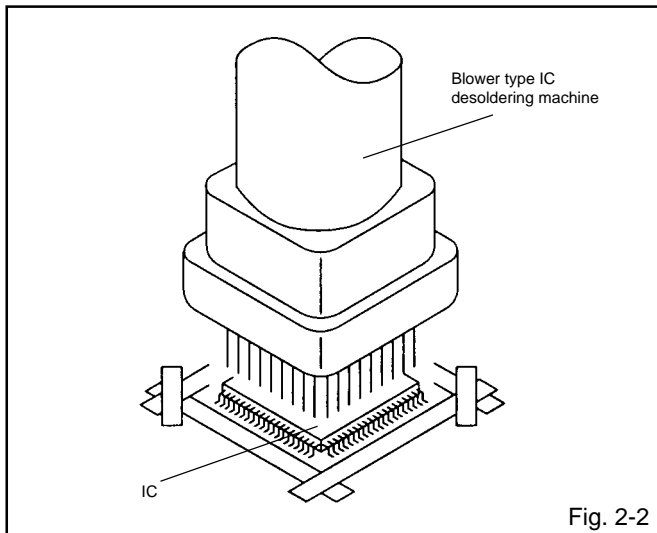
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. (Refer to Fig. 2-2.)

NOTE

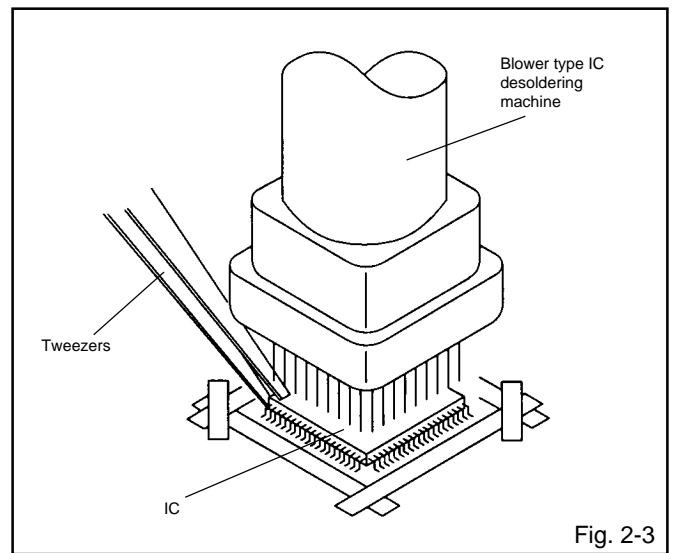
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. (Refer to Fig. 2-3.)

NOTE

Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

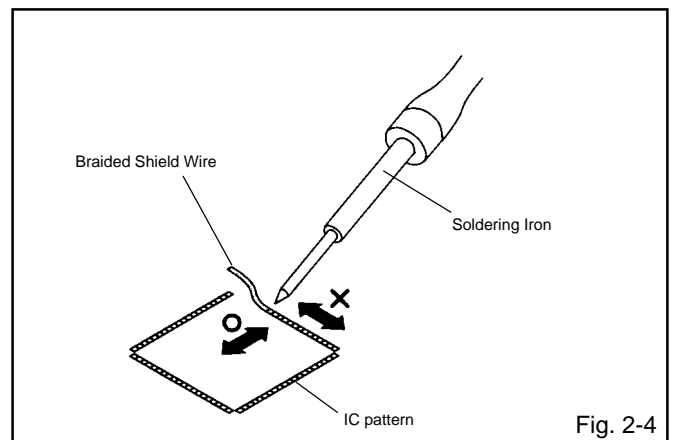


4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. (Refer to Fig. 2-4.)

NOTE

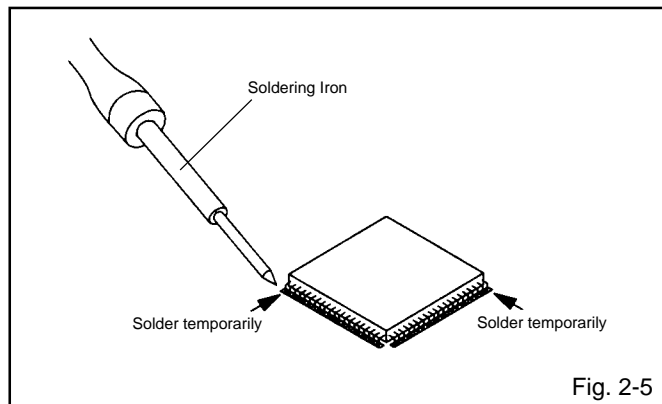
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



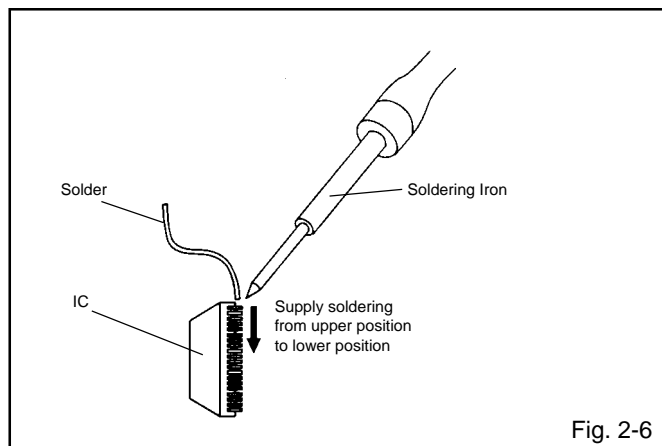
DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. (Refer to Fig. 2-5.)



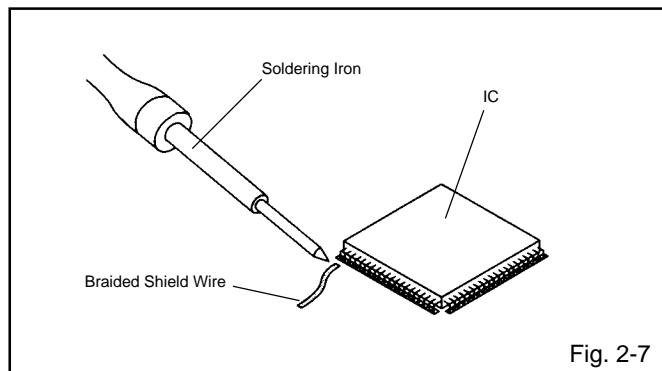
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 2-6.)



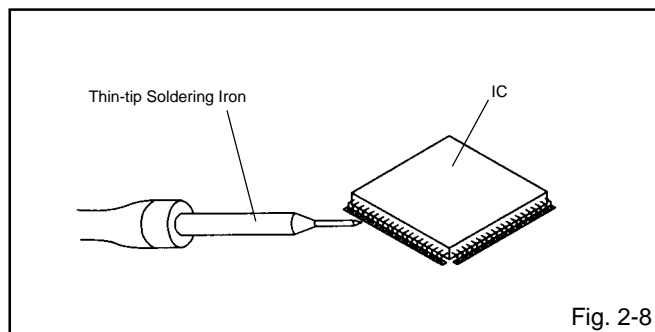
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 2-7.)

NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. (Refer to Fig. 2-8.)



5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass. Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, always be sure to replace the IC in this case.

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily. To enter the Service Mode, press both set key and remote control key for more than 2 seconds.

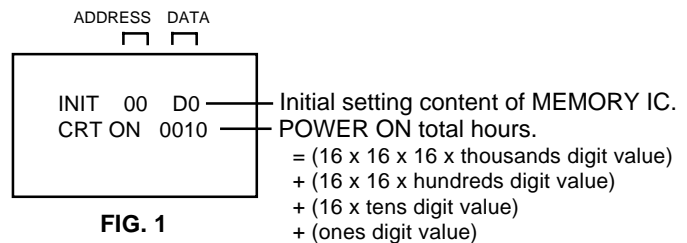
Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the channel setting, and the POWER ON total hours.
VOL. (-) MIN	6	POWER ON total hours is displayed on the screen. Refer to the "CONFIRMATION OF HOURS USED". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

CONFIRMATION OF HOURS USED

POWER ON total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button (6) on the remote control for more than 2 seconds.
3. After the confirmation of using hours, turn off the power.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: No need setting for after INI 0F due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	D0	04	EB	4E	57	B3	24	69	39	00	00	05	90	AE	00	07

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
 2. Press both VOL. DOWN button on the set and Channel button (6) on the remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.
 3. ADDRESS is now selected and should "blink". Using the VOL. +/- button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
 4. Press ENTER to select DATA. When DATA is selected, it will "blink".
 5. Again, step through the DATA using VOL. +/- button until required DATA value has been selected.
 6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
 7. Repeat steps 3 to 6 until all data has been checked.
 8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.
After the data input, set to the initializing of shipping.
 9. Turn POWER on.
 10. Press both VOL. DOWN button on the set and Channel button (1) on the remote control for more than 2 seconds.
 11. After the finishing of the initializing of shipping, the unit will turn off automatically.
- The unit will now have the correct DATA for the new MEMORY IC.

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Pattern Generator

On-Screen Display Adjustment

1. In the condition of NO indication on the screen. Press the VOL. DOWN button on the set and the Channel button (9) on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in Fig. 1-1.

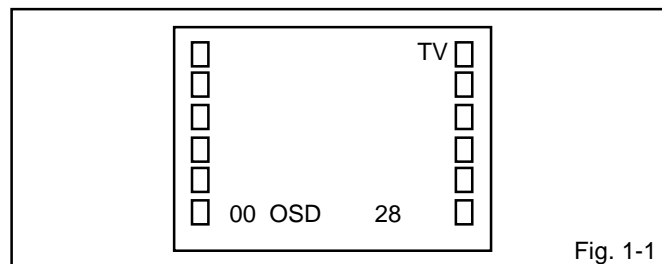


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button (0-9) on the remote control to select the options shown in Fig. 1-2.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	16	CONTRAST CENT
01	CUT OFF	17	CONTRAST MAX
04	H. VCO	18	CONTRAST MIN
05	H. PHASE	19	COLOR CENTER
06	V. SIZE	20	COLOR MAX
07	V. SHIFT	21	COLOR MIN
08	R DRIVE	22	TINT
09	B DRIVE	23	SHARPNESS
10	R BIAS	24	FM LEVEL
11	G BIAS	25	LEVEL
12	B BIAS	26	SEPARATION1
13	BRIGHT CENT	27	SEPARATION2
14	BRIGHT MAX	28	TEST MONO
15	BRIGHT MIN	29	TEST STEREO

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CUT OFF

1. Adjust the unit to the following settings.
R.DRIVE=10, B.DRIVE=10, R.BIAS=64, G.BIAS=64, B.BIAS=64, BRI.CENT=100, CONT.MAX=60.
2. Place the set with Aging Test for more than 15 minutes.
3. Activate the adjustment mode display of Fig. 1-1 and press the channel button (01) on the remote control to select "CUT OFF".
4. Adjust the **Screen Volume** until a dim raster is obtained.

2-2: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of Fig. 1-1 and press the channel button (10) on the remote control to select "R. BIAS".
5. Press the CH. UP/DOWN button on the remote control to select the "R. BIAS", "G. BIAS", "B. BIAS", "R. DRIVE" or "B. DRIVE".
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R. BIAS, G. BIAS, B. BIAS, R. DRIVE, and B. DRIVE at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.

2-3: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-4: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of Fig. 1-1 and press the channel button (05) on the remote control to select "H. PHAS".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-5: VERTICAL SHIFT

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of Fig. 1-1 and press the channel button (07) on the remote control to select "V. SFT".
4. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

ELECTRICAL ADJUSTMENTS

2-6: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V. SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes $10 \pm 2\%$.

2-7: SUB BRIGHTNESS

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRI.CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

2-8: SUB TINT/SUB COLOR

1. Receive the color bar pattern.
2. Connect the oscilloscope to **TP023**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "TINT".
4. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line **(Refer to Fig. 2-1)**
5. Connect the oscilloscope to **TP022**.
6. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(19)** on the remote control to select "COL.CENT".
7. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $120 \pm 5\%$ of the white level. **(Refer to Fig. 2-2)**
8. Receive the color bar pattern. (Audio Video Input)
9. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~7

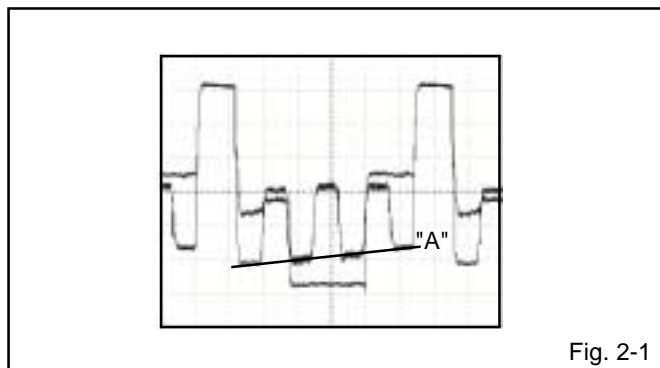


Fig. 2-1

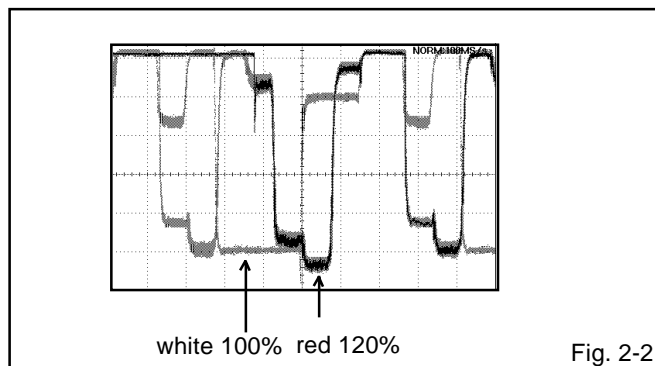


Fig. 2-2

2-9: SUB CONTRAST

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "CONT. MAX".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "60".
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-10: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-3)**

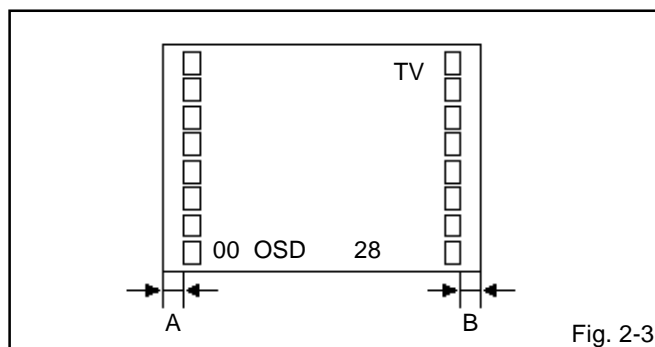


Fig. 2-3

2-11: Confirmation of Fixed Value (Step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below. (RF/AV)

NO.	FUNCTION	STEP NO.
04	H. VCO	04
14	BRIGHT MAX	183
15	BRIGHT MIN	60
16	CONTRAST CENT	30
18	CONTRAST MIN	17
20	COLOR MAX	74
21	COLOR MIN	00
23	SHARPNESS	45
24	FM LEVEL	00
25	LEVEL	00
26	SEPARATION1	00
27	SEPARATION2	00

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

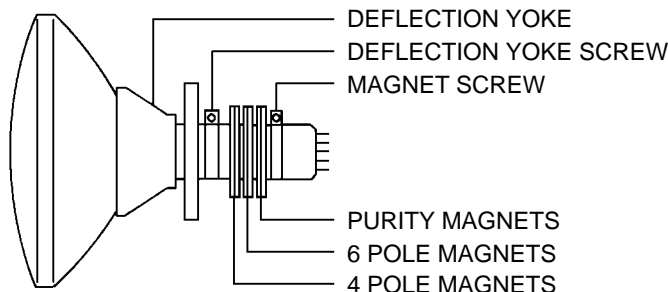


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**

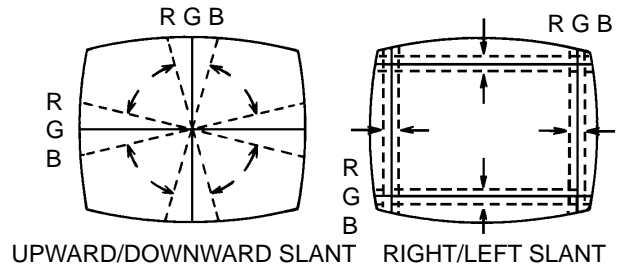
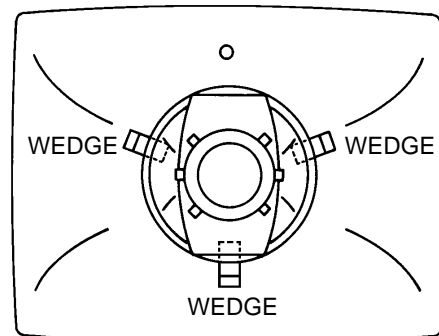


Fig. 3-2-a

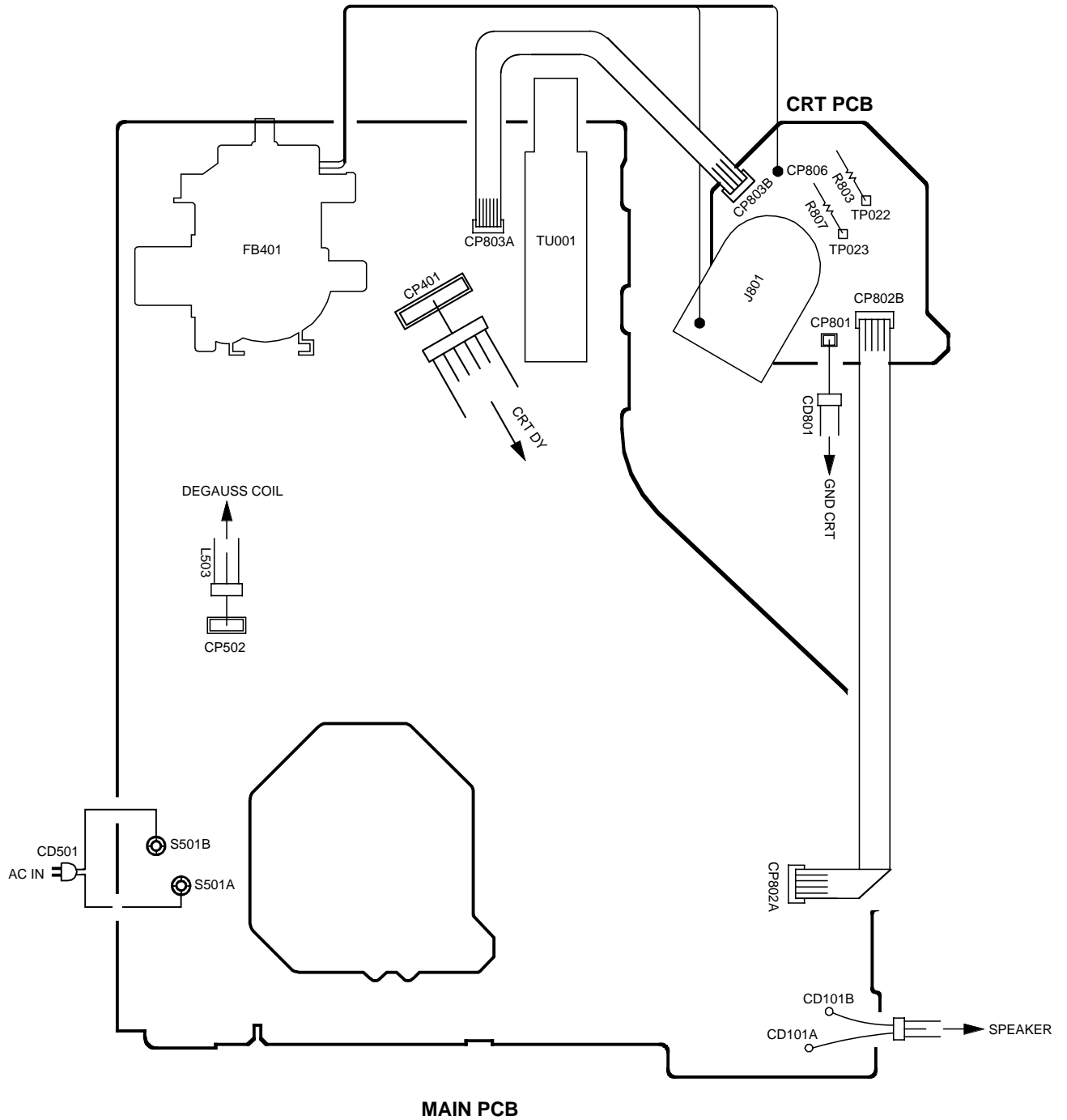


WEDGE POSITION

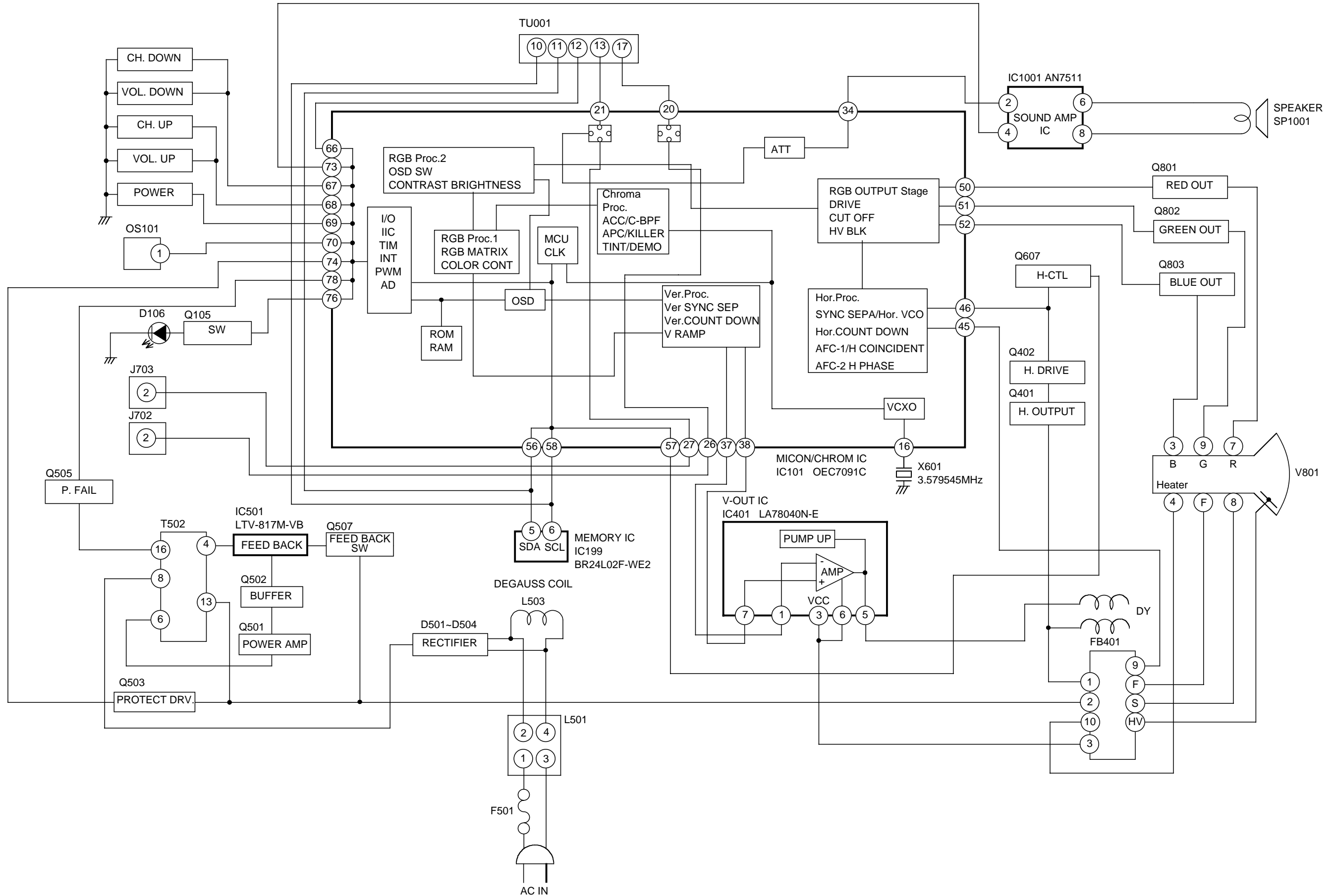
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

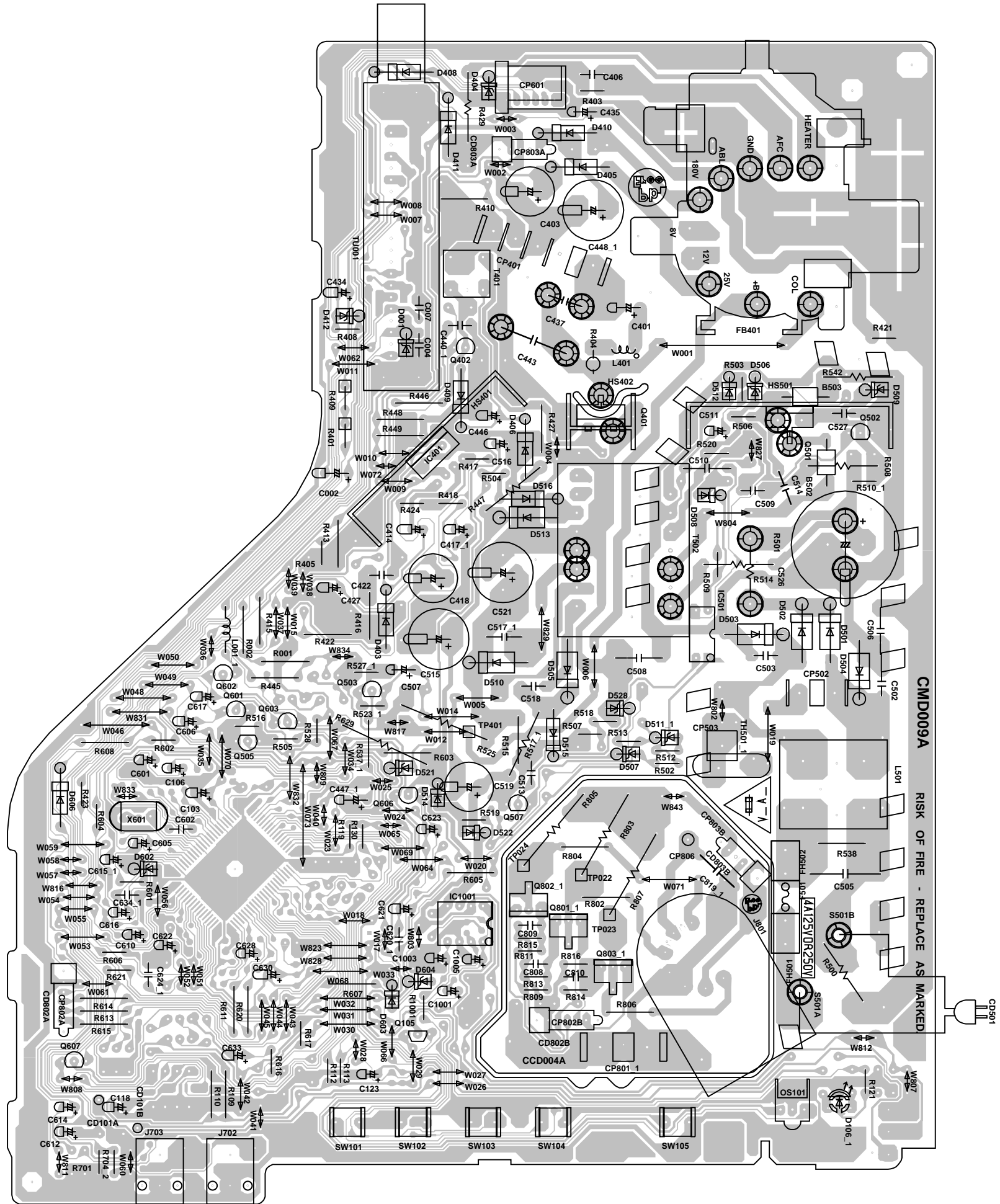
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



BLOCK DIAGRAM

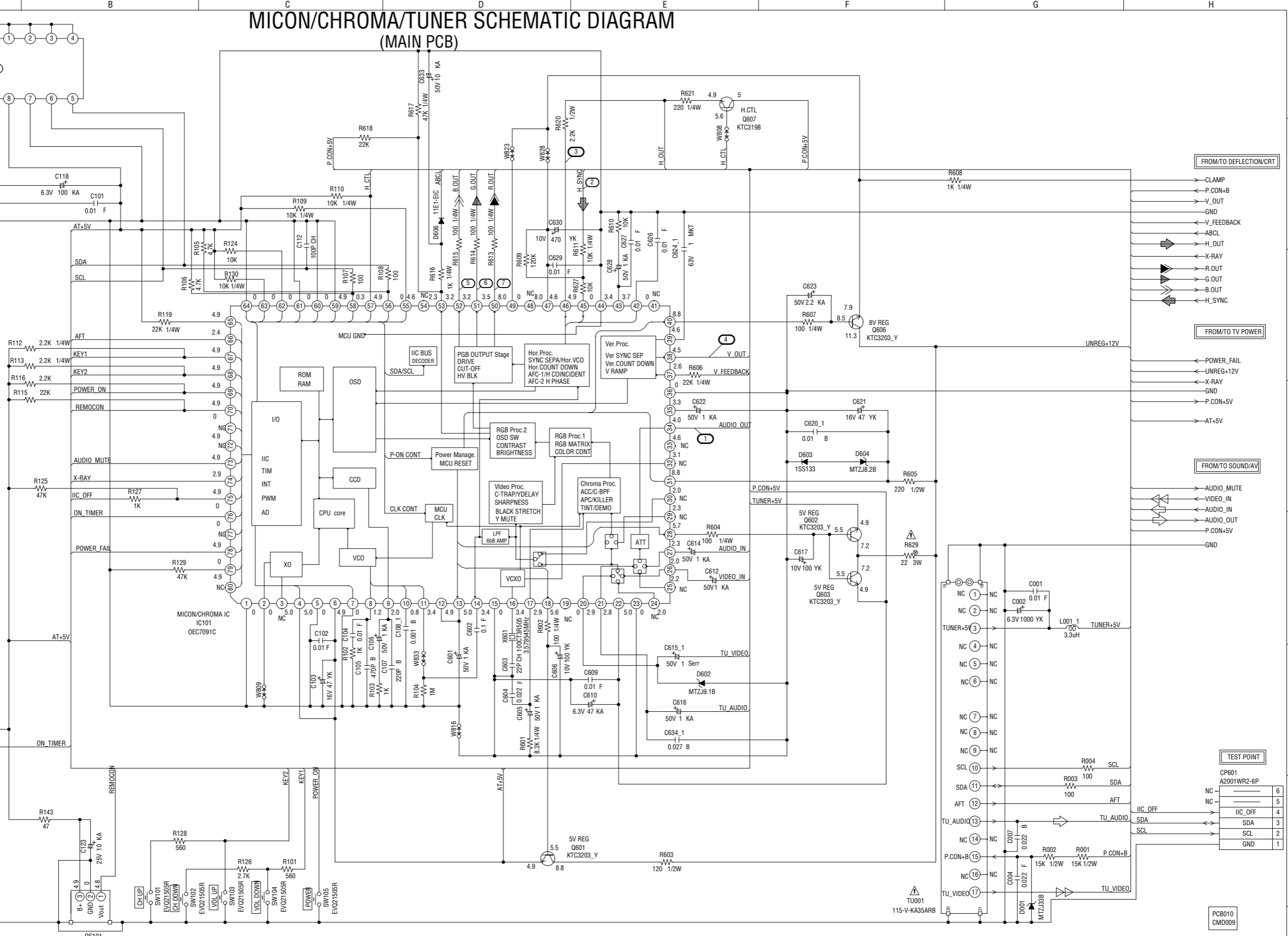


**PRINTED CIRCUIT BOARDS
MAIN/CRT (INSERTED PARTS)
SOLDER SIDE**



MICON/CHROMA/TUNER SCHEMATIC DIAGRAM (MAIN PCB)

1	CNVSS	41	NC
2	XIN	42	HVCO F/B
3	XOUT	43	AFC FILTER
4	TEST1	44	DEF GND
5	VSS	45	FBP IN
6	MCU VCC	46	H OUT
7	TEST0	47	DEF VCC
8	FILT	48	NC
9	HLT	49	HI VCC
10	VHOLD	50	R OUT
11	CVIN	51	G OUT
12	RESET IN	52	B OUT
13	MCU RESET OUT	53	ACL
14	Y SW OUT	54	NC
15	V/C GND	55	PROTECT
16	3.58 XTAL	56	SDA
17	C-APC	57	H_CTL
18	MCU5.7V REG OUT	58	SCL
19	NC	59	NC
20	CVBS IN3	60	NC
21	AUDIO IN3	61	NC
22	V/C VCC	62	DEGAUSS_H
23	MCU TEST	63	STANDBY_H
24	CVBS IN2	64	VOLUME
25	AUDIO IN2	65	NC
26	CVBS IN1	66	AFT
27	AUDIO IN1	67	KEY1
28	5.7V REG OUT	68	KEY2
29	C(Y/C) IN	69	POWER_ON
30	Y(C) IN	70	REMOCON
31	VREG VCC	71	AV2
32	FSC OUT	72	AV1
33	MONITOR OUT	73	AUDIO_MUTE
34	AUDIO ATT OUT	74	X-RAY
35	AUDIO ATT FILTER	75	IIC_OFF
36	TEST 3	76	ON_TIMER
37	V RAMP F/B	77	SYNC
38	V RAMP OUT	78	POWER_FAIL
39	V RAMP CAP	79	NC
40	8.7V REG OUT	80	EXT_MUTE



FROM/TO DEFLECTION/CRT	CLAMP
	P.CON+B
	V_OUT
	V_FEEDBACK
	ABCL
	H_OUT
	X-RAY
	R_OUT
	G_OUT
	B_OUT
	H_SYNC
FROM/TO TV POWER	UNREG+12V
	POWER_FAIL
	UNREG+12V
	X-RAY
	GND
	P.CON+5V
FROM/TO SOUND/AV	AT+5V
	AUDIO_MUTE
	VIDEO_IN
	AUDIO_IN
	AUDIO_OUT
	P.CON+5V
	GND

TEST POINT	CP601	A2001WR2-6P	6
	NC		5
	NC		4
	NC		3
	NC		2
	NC		1

PCB010
CMD009

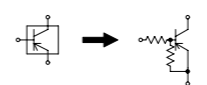
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

CAUTION: DIGITAL TRANSISTOR

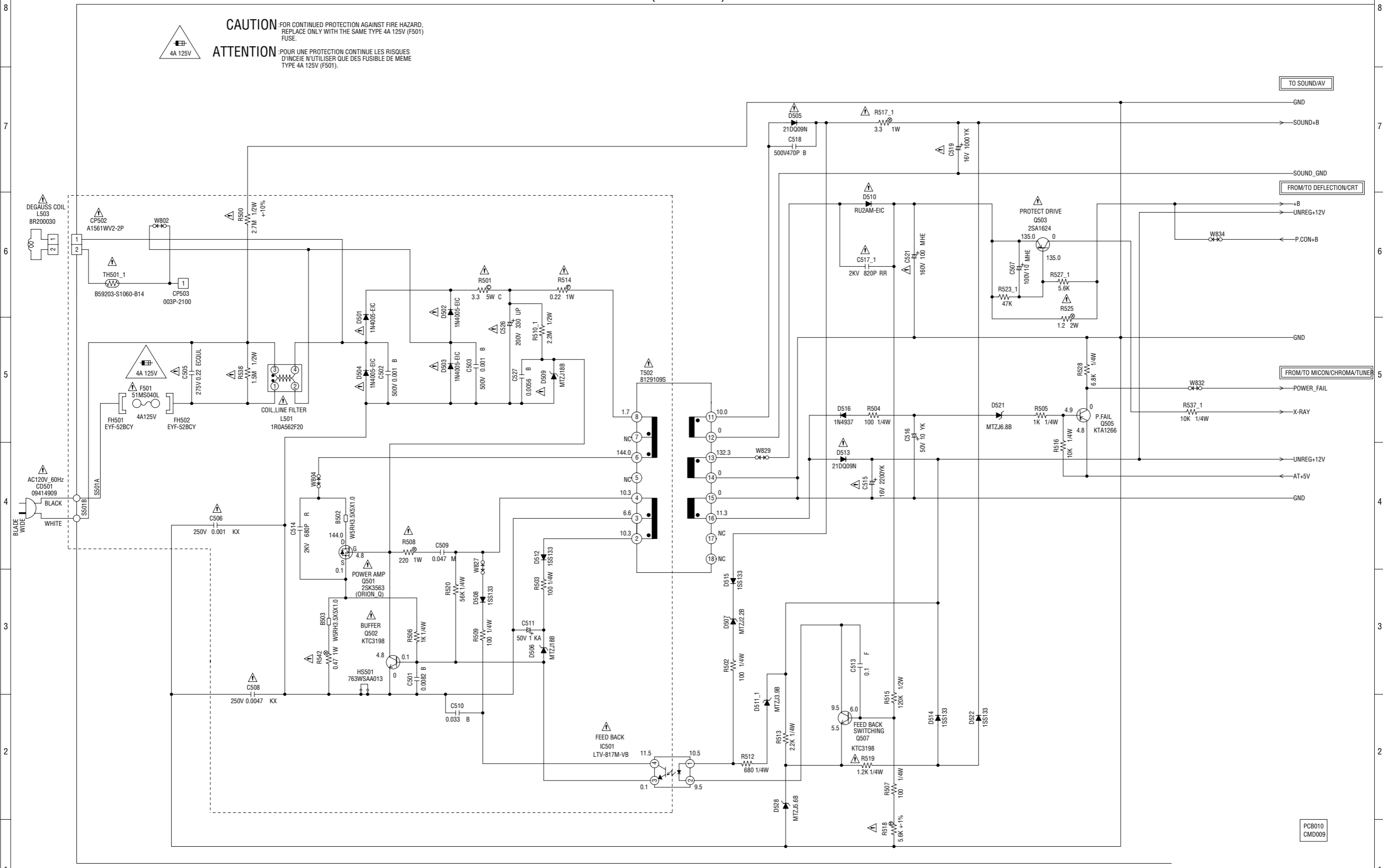


- R.SIGNAL
- G.SIGNAL
- B.SIGNAL
- DEFLECTION SIGNAL
- TUNER VIDEO SIGNAL

TV POWER SCHEMATIC DIAGRAM (MAIN PCB)

CAUTION FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE 4A 125V (F501) FUSE.

ATTENTION POUR UNE PROTECTION CONTINUE LES RISQUES D'INCENDIE N'UTILISER QUE DES FUSIBLE DE MEME TYPE 4A 125V (F501).



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

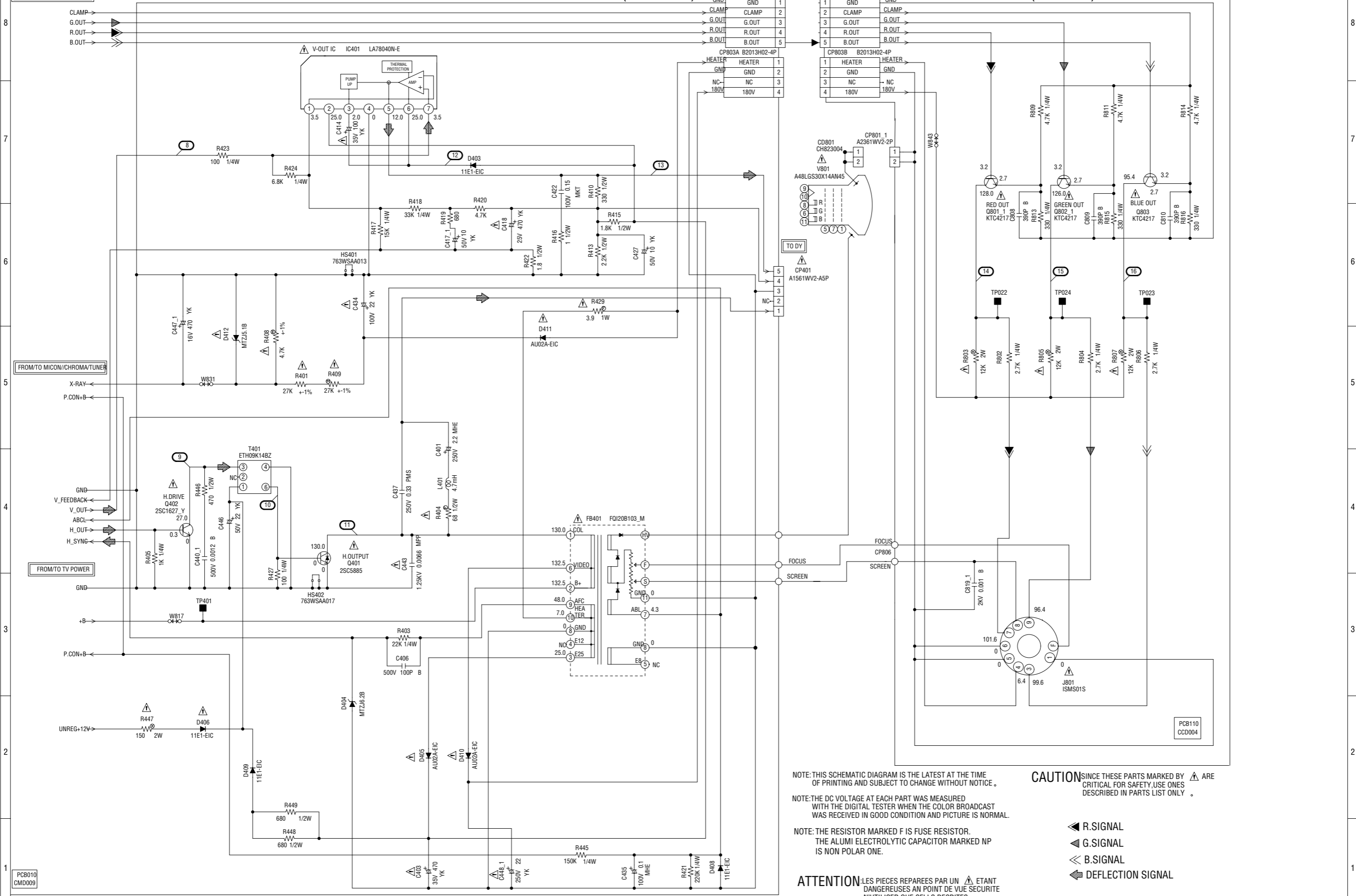
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

ATTENTION LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)

(CRT PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

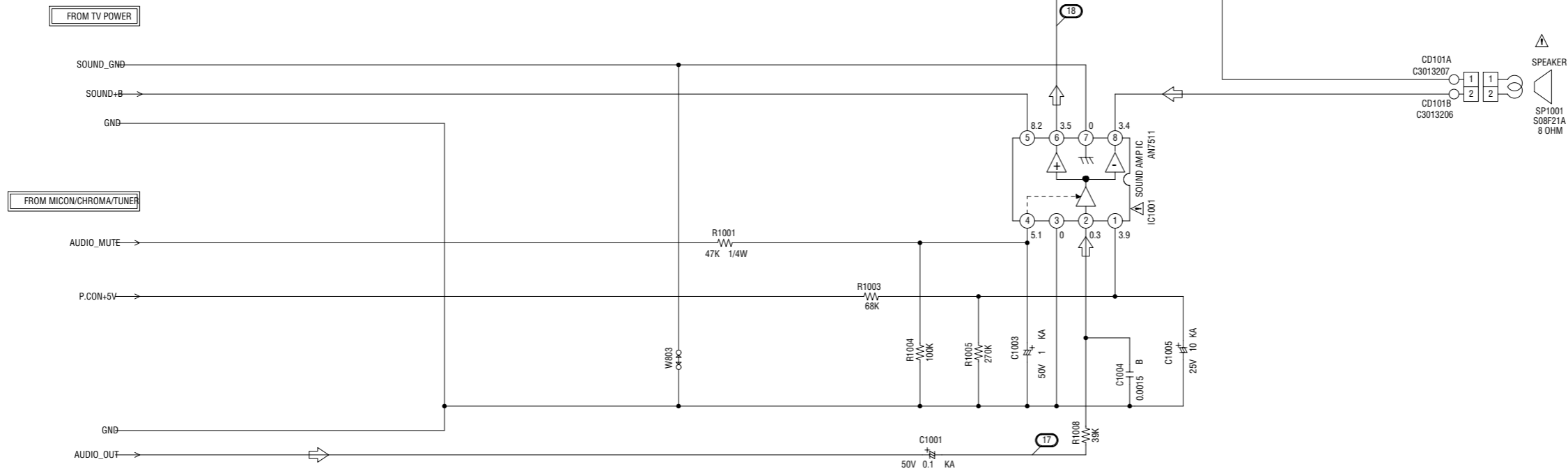
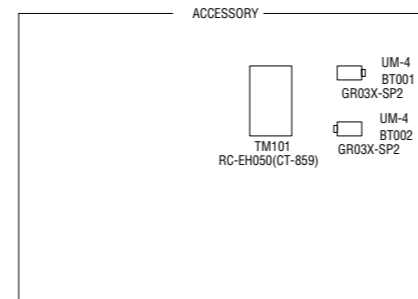
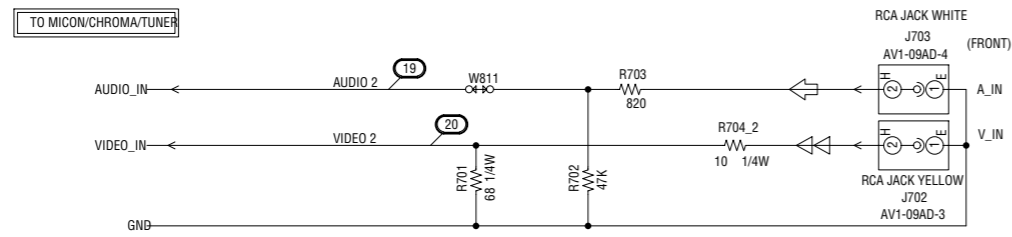
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

CAUTION SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

- R.SIGNAL
- G.SIGNAL
- B.SIGNAL
- DEFLECTION SIGNAL

ATTENTION LES PIECES REPARÉES PAR UN ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

SOUND/AV SCHEMATIC DIAGRAM (MAIN PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

CAUTION SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

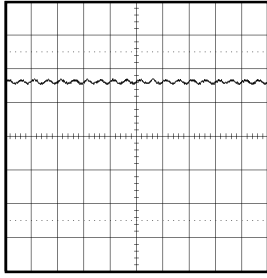
ATTENTION LES PIECES REPARÉES PAR UN ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

TUNER VIDEO SIGNAL
 AUDIO SIGNAL

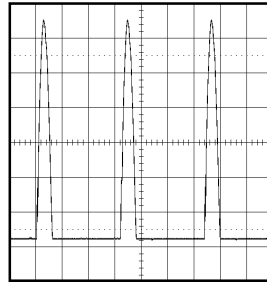
PCB010
CMD009

WAVEFORMS

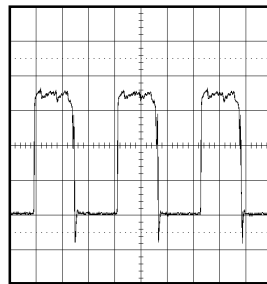
MICON/CHROMA/TUNER



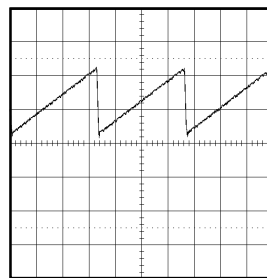
① 0.5V 2ms/div



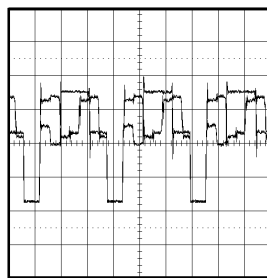
② 20V 20μs/div



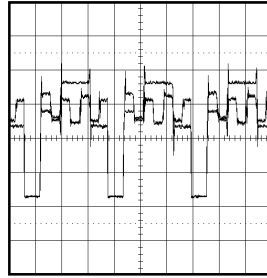
③ 200mV 20μs/div



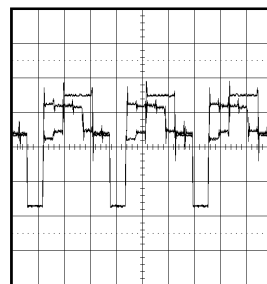
④ 0.5V 5ms/div



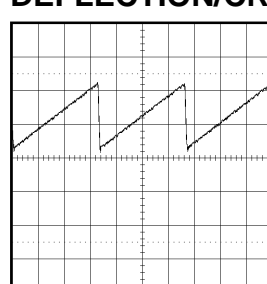
⑤ 1V 20μs/div



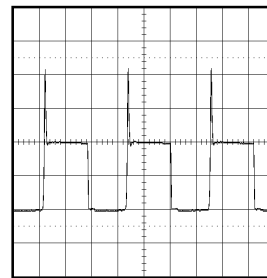
⑥ 1V 20μs/div



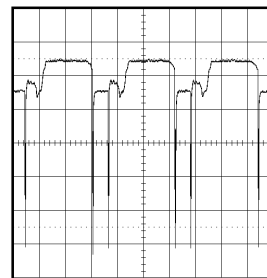
⑦ 1V 20μs/div



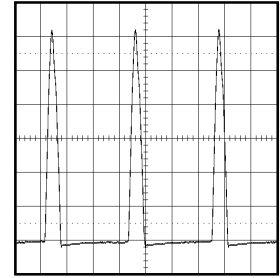
⑧ 0.5V 5ms/div



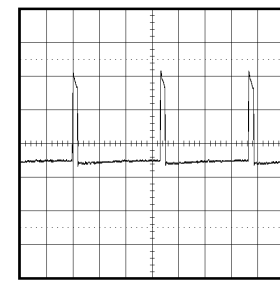
⑨ 20V 20μs/div



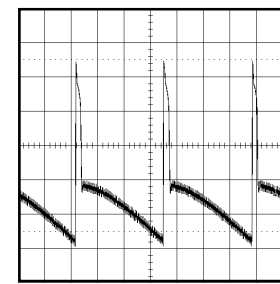
⑩ 2V 20μs/div



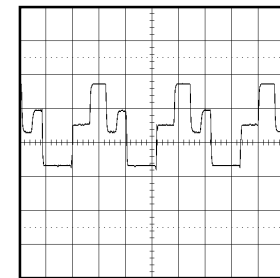
⑪ 200V 20μs/div



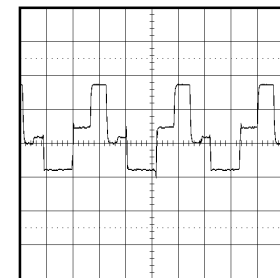
⑫ 10V 5ms/div



⑬ 10V 5ms/div



⑭ 50V 20μs/div

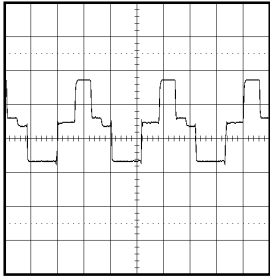


⑮ 50V 20μs/div

DEFLECTION/CRT

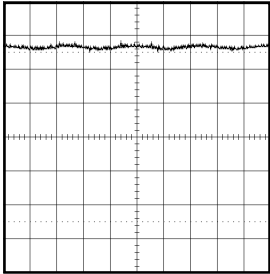
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

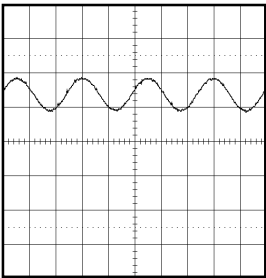


①⑥ 50V 20 μ s/div

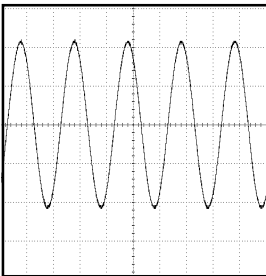
SOUND/AV



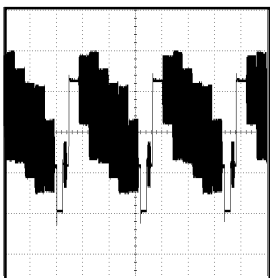
①⑦ 0.5V 1ms/div



①⑧ 1V 1ms/div



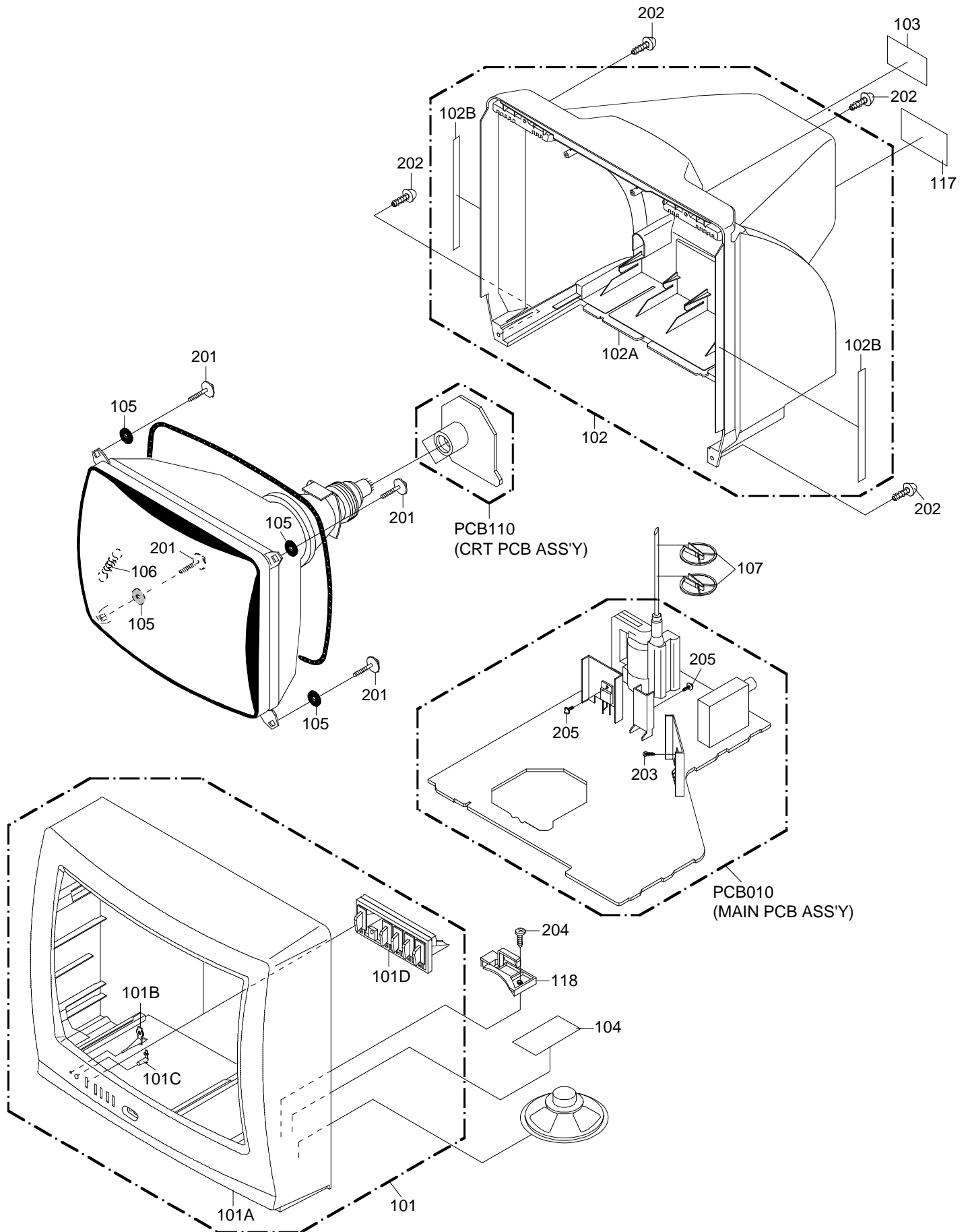
①⑨ 200mV 500 μ s/div



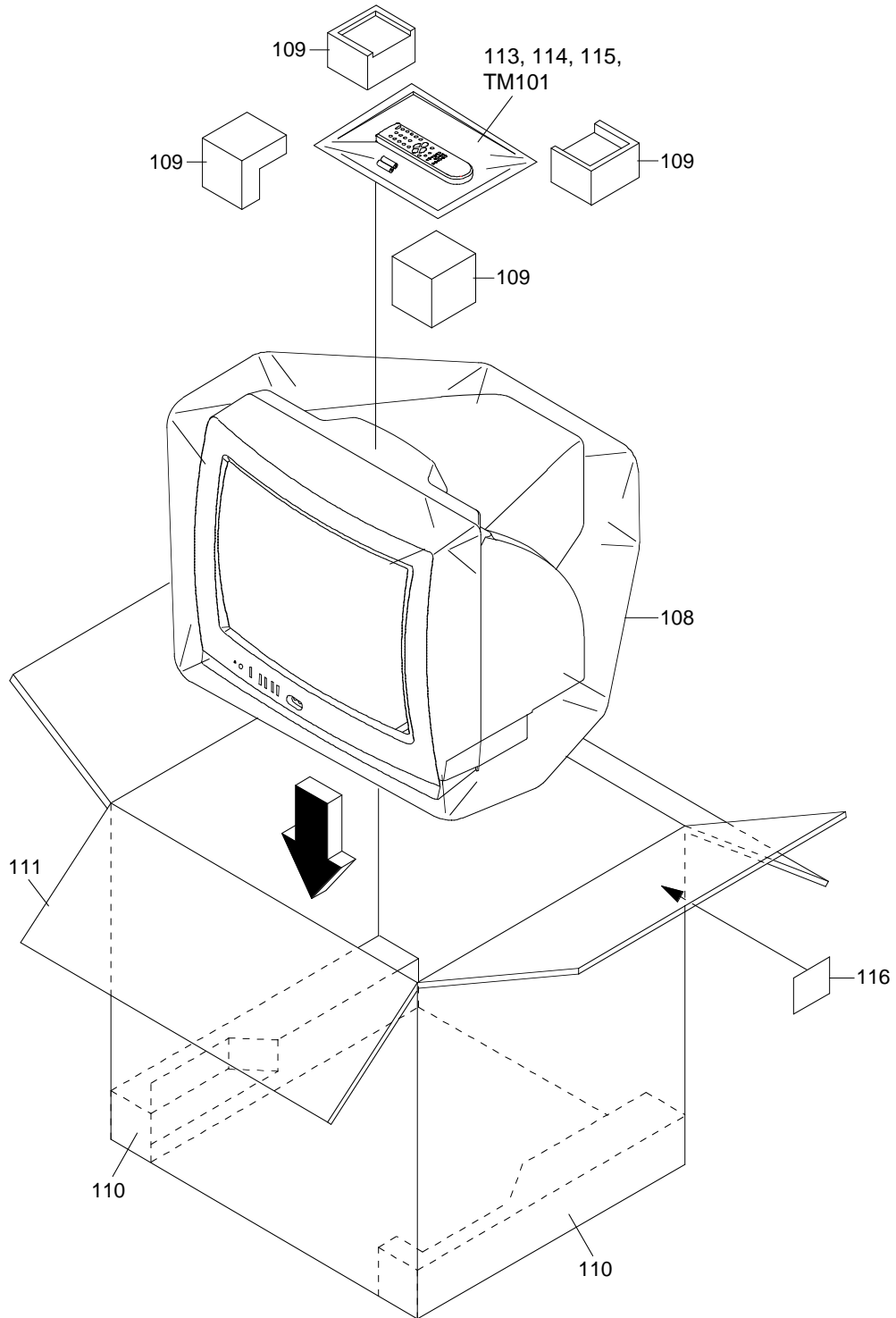
②⑩ 500mV 20 μ s/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW (PACKING DIAGRAM)



MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AE006003	7A701A334A	FRONT CABI ASS'Y	
101A	AE005738	701WPJC538	CABINET,FRONT	
101B	AE001500	713WPAA046	GLASS,LED	
101C	AD300694	713WPAA050	GUIDE,REMOCON	
101D	AE003384	735WPBA980	BUTTON,FRAME	
102	AE005646	7A702A088A	BACK CABI ASS'Y	
102A	AE006175	702WPAA844	CABINET,BACK	
102B	AE005648	800WQ0A091	FELT SHEET	
103	AE005881	722549A428	SHEET,RATING	
104	AE005650	723000C727	SHEET,CAUTION	
105	AD302158	800WR0A002	SHEET,CRT SUPPORT	
106	BZ710660	741WUA0021	SPRING,EARTH	
107	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
108	AE005652	791WHAA126	FILM BAG	
109	AD300700	792WHAA054	PACKAGE,TOP	
110	AD300701	792WHAA055	PACKAGE,BOTTOM	
111	AE005882	793WCDC628	GIFT BOX	
112	AE005883	A3M219S975	INSTRUCTION BOOK KIT	
113	AE005715	JB5KD200	POLYBAG,INSTRUCTION(REDCAUTION)	
114	AE004983	J2D60117A	REGISTRATION CARD	
115	AE005884	J3M21921A	INSTRUCTION BOOK(E,S)	
116	AE005885	723000C833	SHEET,BAR CODE	
117	AE005657	726000A085	SHEET,CRT SERVICEMAN	
118	AE006178	735WPAA938	HOLDER,SPEAKER	
201	AE005928	8160H50B8U	SCREW,TAP TITE(P)	W5x28
202	AE004847	8117540A6U	SCREW,TAP TITE(B0) TRUSS	4x16
203	AE003531	810763080U	SCREW,TAP TITE(S) BRAZIER	3x8
204	AE003528	8110630A0U	SCREW,TAP TITE(P) BRAZIER	3x10
205	AE005659	8109I3080U	SCREW,TAP TITE(B) WH7	3x8

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
RESISTORS			
△R401	BZ210089	R4X5T6273F	R,METAL 27K OHM 1/6W
△R404	AE001556	R615U2680J	R,FUSE 68 OHM 1/2W
△R408	BZ210258	R4X5T6472F	R,METAL 4.7K OHM 1/6W
△R409	BZ210089	R4X5T6273F	R,METAL 27K OHM 1/6W
△R429	AE005886	R638813R9J	R,FUSE 3.9 OHM 1W
△R447	BZ210229	R3X28A151J	R,METAL OXIDE 150 OHM 2W
△R500	BZ210080	R0G3K2275K	RC 2.7M OHM 1/2W
△R501	AD300652	R5X2CD3R3J	R,CEMENT 3.3 OHM 5W
△R508	BZ210240	R3X181221J	R,METAL OXIDE 220 OHM 1W
R509	AD301203	R002T4101J	RC 100 OHM 1/4W
R510	AE003279	R00202225J	RC 2.2M OHM 1/2W
△R514	AE005735	R63881R22J	R,FUSE 0.22 OHM 1W
R515	BZ210081	R002T2124J	RC 120K OHM 1/2W
△R517	AE001696	R3X1813R3J	R,METAL OXIDE 3.3 OHM 1W
△R518	BZ210244	R4X5T6562F	R,METAL 5.6K OHM 1/6W
△R519	BZ210124	R002T4122J	RC 1.2K OHM 1/4W
△R525	AD301315	R3X18A1R2J	R,METAL OXIDE 1.2 OHM 2W
△R538	BZ210206	R002T2155J	RC 1.5M OHM 1/2W
△R542	BZ210251	R3X181R47J	R,METAL OXIDE 0.47 OHM 1W
△R629	AE000081	R3X28B220J	R,METAL OXIDE 22 OHM 3W
△R803	BZ210050	R3X18A123J	R,METAL OXIDE 12K OHM 2W
△R805	BZ210050	R3X18A123J	R,METAL OXIDE 12K OHM 2W
△R807	BZ210050	R3X18A123J	R,METAL OXIDE 12K OHM 2W
CAPACITORS			
△C403	BZ110149	E02LT4471M	CE 470 UF 35V
C414	AD301434	E02LU4101M	CE 100 UF 35V
△C418	BZ110041	E02LT3471M	CE 470 UF 25V
△C434	BZ110195	E02LU8220M	CE 22 UF 100V
C437	BZ110174	P4J7F3334J	CMPP 0.33 UF 250V PMS
△C443	AE001548	P4N8FJ662H	CMPP 0.0066UF 1.25KV
C446	BZ110205	E02LU5220M	CE 22 UF 50V
△C448	BZ110204	E0ELFD220M	CE 22 UF 250V
C503	BZ110061	C0JTB0513K	CC 0.001 UF 500V B
△C505	BZ110025	P2122B224M	CMP 0.22 UF 275V ECQUL
△C506	AD301026	CD39E0M13M	CC 0.001 UF 250V
△C508	AE002878	CD39E0MQ3M	CC 0.0047UF 250V
C514	BZ110172	C03L0R7U2K	CC 680 PF 2KV R
△C515	BZ110135	E02L02222M	CE 2200 UF 16V
△C517	BZ110203	C0PLRR7W2K	CC 820 PF 2KV RR
△C519	BZ110207	E02LT2102M	CE 1000 UF 16V
△C521	BZ110092	E5EZFB101M	CE 100 UF 160V
△C526	AD301635	E51CGC331M	CE 330 UF 200V
C527	79091377	CQGTB04S3K	CC 0.0056UF 50V B
C615	AE003280	E52H05010M	CE 1 UF 50V
C819	BZ110247	C0JBB0713K	CC 0.001 UF 2KV B
DIODES			
D001	BZ410037	D97U03301B	DIODE,ZENER MTZJ33B T-77
D106	BZ410054	0021721150	LED SLR-342VCT32
D403	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D404	BZ410066	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77
△D405	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
△D406	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D408	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D409	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
△D410	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
△D411	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
△D412	BZ410020	D97U05R11B	DIODE,ZENER MTZJ5.1B T-77
△D501	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△D502	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△D503	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△D504	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△D505	BZ410010	D28T21DQN9	DIODE,SCHOTTKY 21DQ09N-TA2B1
D506	AD300671	D97U01801B	DIODE,ZENER MTZJ18B T-77
D507	BZ410067	D97U02R21B	DIODE,ZENER MTZJ2.2B T-77
D508	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△D509	AD300671	D97U01801B	DIODE,ZENER MTZJ18B T-77
△D510	BZ410080	D2WXRU2AM0	DIODE,SILICON RU2AM-EIC
D511	BZ410064	D97U03R91B	DIODE,ZENER MTZJ3.9B T-77
D512	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△D513	BZ410010	D28T21DQN9	DIODE,SCHOTTKY 21DQ09N-TA2B1
D514	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
DIODES			
D515	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D516	AD300731	D2WXN49370	DIODE,SILICON 1N4937
D521	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D522	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D528	BZ410021	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
D602	BZ410023	D97U09R11B	DIODE,ZENER MTZJ9.1B T-77
D603	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D604	BZ410058	D97U08R21B	DIODE,ZENER MTZJ8.2B T-77
D606	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
ICS			
IC101	AE005644	I56F07091C	IC OEC7091C
IC199	AE005642	A3M218S015	INIT DATA BR24L02F-WE2
△IC401	AE002783	I03TD804N0	IC LA78040N-E
△IC501	BZ410088	0002E00610	PHOTO COUPLER LTV-817M-VB
△IC1001	BZ611001	I01DP75110	IC AN7511
TRANSISTORS			
Q105	BZ510086	TPATB03003	COMPOUND TRANSISTOR KRA102MAT
△Q401	AE000656	TC1G058850	TRANSISTOR,SILICON 2SC5885
△Q402	BZ510089	TC5T01627Y	TRANSISTOR,SILICON 2SC1627_Y(TPE2)
△Q501	AE002251	T25F035630	FET 2SK3563(ORION_Q)
△Q502	BZ510069	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
△Q503	BZ510004	TA3T016240	TRANSISTOR,SILICON 2SA1624-AA
Q505	BZ510073	TAATA12660	TRANSISTOR,SILICON KTA1266-AT(Y,GR)
Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
Q601	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q602	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q603	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q606	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q607	BZ510069	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
△Q801	BZ510091	TCA0042170	TRANSISTOR,SILICON KTC4217(O,Y)
△Q802	BZ510091	TCA0042170	TRANSISTOR,SILICON KTC4217(O,Y)
△Q803	BZ510091	TCA0042170	TRANSISTOR,SILICON KTC4217(O,Y)
COILS & TRANSFORMERS			
L001	BZ310136	021LA63R3K	COIL 3.3 UH
L401	AD301644	021L75472J	COIL 4.7 MH
△L501	AD301395	029T000104	COIL,LINE FILTER 1R0A562F20
△L503	AE001529	028R200030	COIL,DEGAUSS 8R200030
T401	BZ310157	045009003J	TRANS,HORIZONTAL DRIVE ETH09K14BZ
△T502	AE001531	048129109S	TRANSFORMER,SWITCHING 8129109S
JACKS			
J702	AE005633	060Q401112	RCA JACK AV1-09AD-3
J703	AE005632	060Q401111	RCA JACK AV1-09AD-4
△J801	BZ614434	066F120018	SOCKET,CATHODE RAY TUBEISMS01S
SWITCHES			
SW101	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW102	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW103	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW104	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW105	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
P.C.BOARD ASSEMBLIES			
PCB010	AE005641	A3M218S010	PCB ASS'Y CMD009A
PCB110	AE005643	A3M218S110	PCB ASS'Y CCD004A
MISCELLANEOUS			
B502	BZ310121	024HT03553	CORE,BEADS W5RH3.5X5X1.0
B503	BZ310121	024HT03553	CORE,BEADS W5RH3.5X5X1.0
BT001	AE005640	141R004016	BATTERY,MANGAN GR03X-SP2
BT002	AE005640	141R004016	BATTERY,MANGAN GR03X-SP2
△CD501	AE005639	1209414909	CORD,AC BUSH 9414909
CD801	AE005637	06CH823004	CORD,CONNECTOR CH823004
CD802	BZ614310	WCL6844038	FLAT CABLE AWM2468 AWG26 5C GRAY 440MM
CD803	BZ614493	WBL6032038	FLAT CABLE AWM2468 AWG26 4C BLACK 320MM
△CP401	BZ614303	069S450089	CONNECTOR PCB SIDE A1561WV2-A5P
△CP502	BZ614283	069S420110	CONNECTOR PCB SIDE A1561WV2-2P
CP503	BZ614016	069W01001A	CONNECTOR PCB SIDE 003P-2100
CP601	AE005634	069S260639	CONNECTOR PCB SIDE A2001WR2-6P
CP801	BZ614269	069S320010	CONNECTOR PCB SIDE A2361WV2-2P
CD101A	AE005636	06C3013207	CORD,CONNECTOR C3013207
CD101B	AE005635	06C3013206	CORD,CONNECTOR C3013206
CP802A	BZ614276	067U005049	WIRE HOLDER B2013H02-5P
CP802B	BZ614276	067U005049	WIRE HOLDER B2013H02-5P
CP803A	BZ614334	067U004029	WIRE HOLDER B2013H02-4P

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
VARIABLE RESISTORS			
CP803B	BZ614334	067U004029	WIRE HOLDER
EL001	BZ614043	124116281A	EYE LET
EL002	BZ614044	124120301A	EYE LET
△F501	AD302166	081PC04005	FUSE
△FB401	AE003283	043220061F	TRANSFORMER,FLYBACK
FH501	AE002634	06710T0009	HOLDER,FUSE
FH502	AE002634	06710T0009	HOLDER,FUSE
OS101	AD301048	0773071001	REMOTE RECEIVER
△SP1001	AE005722	070Y132027	SPEAKER
△TH501	AD302000	D8EE0B1400	DEGAUSS ELEMENT
TM101	AE003331	076N0EH050	TRANSMITTER
△TU001	AE006069	0163300018	RF UNIT
△V801	AE002028	098Y200494	CRT W/DY
X601	BZ613004	100CT3R505	CRYSTAL

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
 CE..... ALUMI ELECTROLYTIC CAPACITOR
 CP..... POLYESTER CAPACITOR
 CPP..... POLYPROPYLENE CAPACITOR
 CPL..... PLASTIC CAPACITOR
 CMP..... METAL POLYESTER CAPACITOR
 CMPL..... METAL PLASTIC CAPACITOR
 CMPP..... METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN